# X-driven development: finding the right combination of approaches for systems engineering

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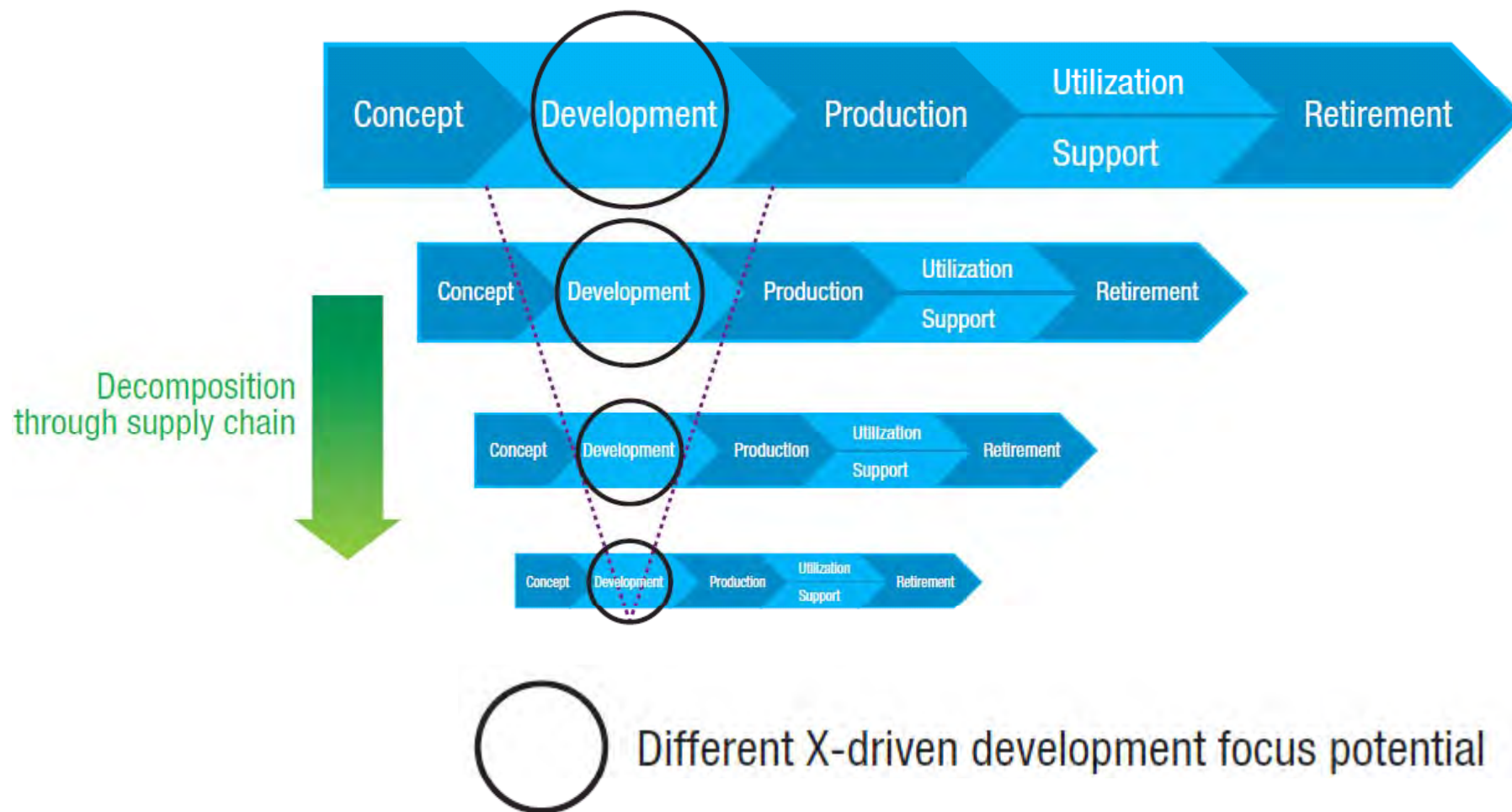
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# One size doesn't fit all
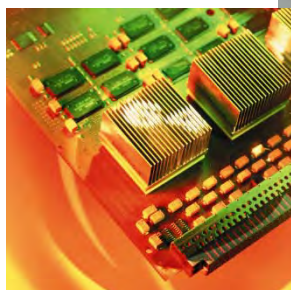## *Why variety is the spice of life in development approaches*

- *Based* vs. *driven* development?
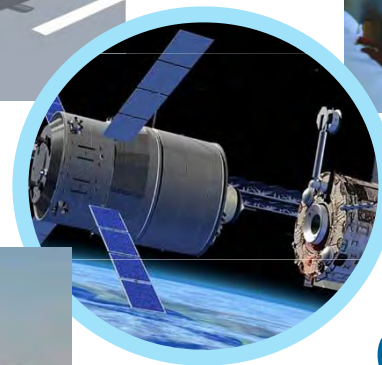
- What are the project characteristics that matter?

- What about the industry?

- A framework for analyzing and selecting approaches

- Strengths and weaknesses

- Putting it all together

# SE life-cycle "V" decomposition diagram



Decomposition through supply chain

Concept — Development — Production — Utilization / Support — Retirement

Different X-driven development focus potential

smarter planet SOA
smarter software for a smarter planet
IBM

# Different industries have different needs…

- Safety

- Regulatory compliance

- Development timescales

- Project scale

- Project life

- …

Cost

Quality    Time
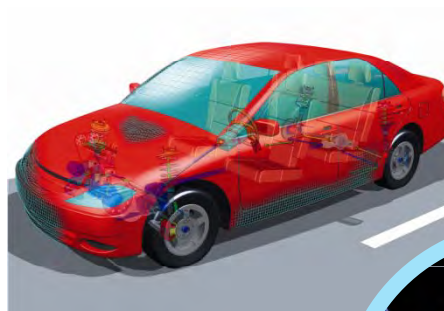
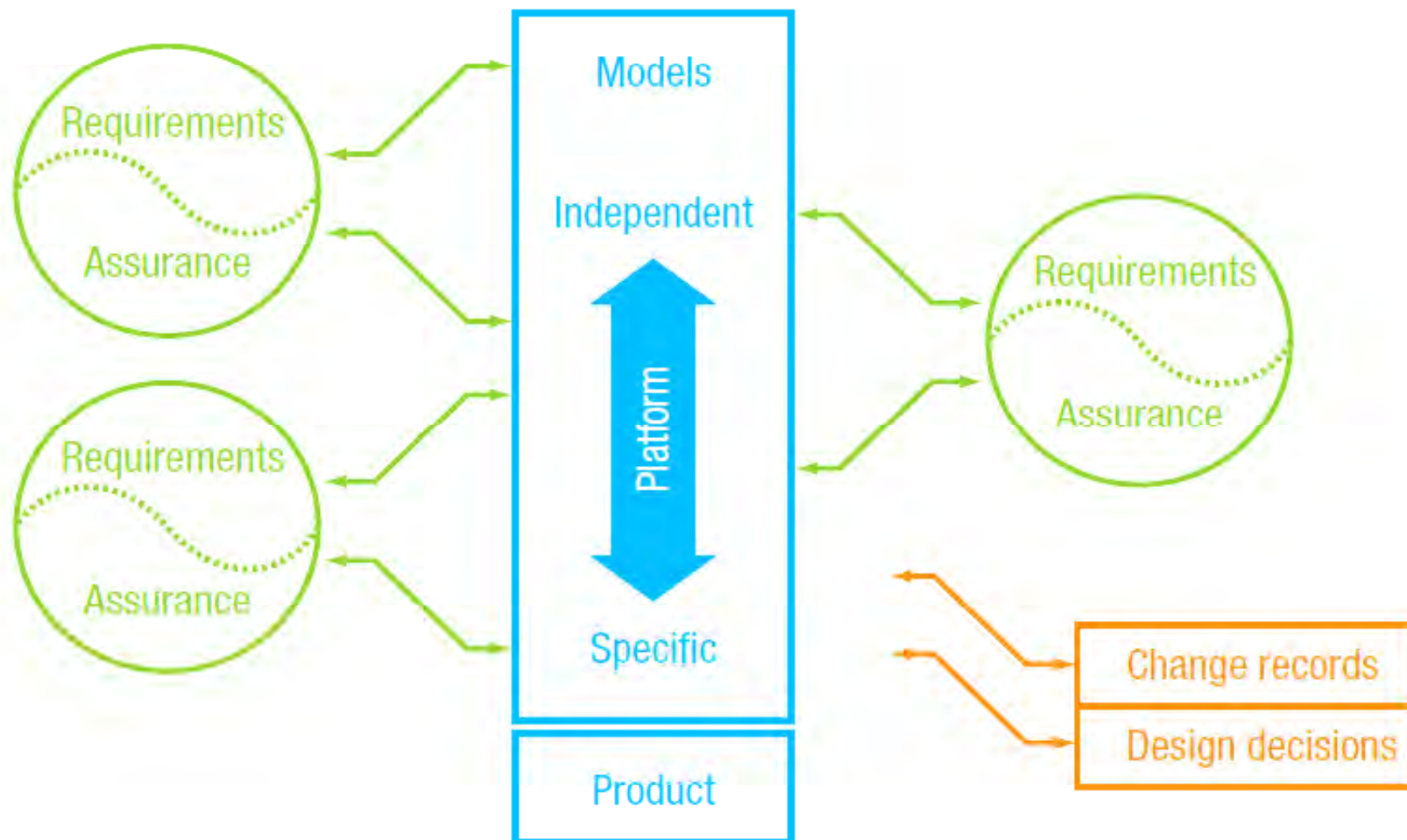# A framework for analyzing and selecting approaches

- The Hitchins' 5-layer model

Socio-economic

Industrial systems engineering

Business systems engineering

Project or system level

Product level

● **Development artifact relationship diagram**

# Matching the development approach to the project

| Formality | Industry | Level | RDD | MDD | TDD |
|---|---|---|---|---|---|
| Informal | Consumer Products | OEM | | | |
| | | Supply chain | | | |
| | | Detailed design | | | |
| | Mobile Networks / Devices | OEM | | | |
| | | Supply chain | | | |
| | | Detailed design | | | |
| | Power grid | Prime | | | |
| | | Supply chain | | | |
| | | Detailed design | | | |
| | Aerospace & Defense | Prime | | | |
| | | Supply chain | | | |
| | | Detailed design | | | |
| Formal | Nuclear Industry | Prime | | | |
| | | Supply chain | | | |
| | | Detailed design | | | |

Highly applicable    Somewhat applicable    Occasionally applicable    Not applicable

# Summary

- There is no single 'right' answer
- The development approach is a means to an end

But…

- Predictable delivery results from minimizing risks
- The right approach is the one that best manages and mitigates risk

# Glossary

- MDD    Model-driven development

- RDD    Requirements-driven development

- TDD    Test-driven development